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TITLE
NET FOR SPORT PRACTICE

PRELIMINARY CLASS: 273

NET FOR SPORT PRACTICE

Background of the Invention

This invention relates to an apparatus providing for practicing one or more player's aim in sports in which a sporting object is thrown or launched.

Many attempts have been made to provide an apparatus functioning as a target for pitching a baseball, for use in the practice of baseball throwing aim. Some of these devices catch the baseball, such as Maye, U.S. Patent No. 4,955,607 ("Maye"); Yalvac, U.S. Patent No. 5,083,774 ("Yalvac"); some return the baseball to the player, such as Wilson, U.S. Patent No. 4,913,427; White et al., U.S. Patent No. 4,364,562 (White"); Larson, U.S. Patent No. 4,026,551; and some register a hit within a "strike zone" by electromechanical means, such as Hanabusa et al., U.S. Patent No. 5,222,731; Yancey, U.S. Patent No. 5,046,729.

Some of these apparatuses, being adapted for the pitching of baseballs, require a certain sturdiness and therefore substantial weight for receiving, without damage or excessive recoil, a fast-pitched baseball, such as the apparatuses of White and Yalvac. Others of these apparatuses employ multiple components which detract from portability and ease of set-up, such as the apparatus of Maye. And, in other ways, apparatuses adapted to the pitching of baseballs are not ideal for pitching or throwing of other objects thrown or launched in other sports.

For example, many sports, such as volleyball, tennis and frisbee involve the passing of a thrown or launched object between two players. None of the prior devices for aiming practice in the pitching of baseballs readily permit practice by more than one player at a time. A particular disadvantage of failing to permit two-way practice is that it is not only necessary in such sports to practice aiming the projectile so that it impacts a vertical plane ("goal plane"), e.g., a batter's box, at a specific location, it is also necessary to practice delivering the object beyond the goal plane a particular distance. In sports such as tennis, the player desires not only to clear the net but also to control where the ball will land in the opposite court by controlling velocity, delivery location and launch angle. A device

adapted to register the location of a thrown object in a single, goal plane is not suitable for practicing sports in which it is desired to, first, pass a thrown or launched object through a specific location ("goal") in the goal plane and, second, deliver the object to a specific location in a horizontal plane ("court plane") therebeyond.

Moreover, in baseball, the goal in the goal plane never changes--it is the strike zone. In many sports, particularly sports in which an object is thrown or launched over a net, target locations in both the goal and court planes change constantly throughout the game, depending on where the players are located, how the players are moving, and the initial conditions of the location and the velocity the object as it is received by the player desiring to deliver or return it. Devices which register strikes or hits only in a particular location don't allow practice of aiming at a moving target.

Further, prior art devices adapted for the pitching of baseballs presume a goal size and shape that is predetermined by the rules of baseball. Other sports do not necessarily have a predetermined goal size and shape such as a strike zone. It may be advantageous in other sports to have a goal size or shape that is tailored in some other way.

Accordingly, there is a need for a novel net for sport practice which provides for practice by one or more players aiming at varying goals on a goal and delivering to varying locations on a court plane, the goals having sizes and shapes tailored to the needs of the sport, the apparatus minimizing weight and thereby maximizing portability, and maximizing ease of set-up and use.

Summary of the Invention

A net for sport practice of the present invention solves the aforementioned problems and meets the aforementioned needs by employing a net having one or more apertures therein, the apertures being advantageously sized and shaped for passage of a ball or other object thrown or launched therethrough, in order to promote conditioning of the player's aim at a goal, and delivery into a court plane. A specially adapted frame may be employed for supporting the net; however, the net is preferably strung between existing standards, to minimize weight and maximize portability and ease of use. A backstop

having inside rebound surfaces may be attached to the frame, for returning the object to the player.

Therefore, it is a principal object of the present invention to provide a novel net for sport practice.

It is another object of the present invention to provide such a net that facilitates practice of both aiming, at a goal plane, and delivering, into a court plane.

It is a further object of the present invention to provide such a net that accommodates a plurality of players.

It is still a further object of the present invention to provide such a net that employs a goal size and shape tailored to a particular sport.

It is yet another object of the present invention to provide such a net having a plurality of goals, for practicing aim at and delivery to multiple locations.

It is still another object of the present invention to provide such a net that minimizes weight and maximizes portability, and maximizes ease of set-up and use.

The foregoing and other objects, features and advantages of the present invention will be more readily understood upon consideration of the following detailed description of the invention, taken in conjunction with the following drawings.

Brief Description of the Drawings

Figure 1 is a pictorial view of a net for sport practice according to the present invention.

Figure 2 is an elevation of a partial portion of the net of Figure 1.

Figure 3 is a section view of the net of Figure 2, taken along a line 3-3 thereof.

Figure 4 is an elevation of the full portion of the net of Figure 2.

Figure 5 is an elevation of a frame member according to the present invention, for use with the net of Figure 1 being partially cut-away.

Figure 6 is a pictorial view of an attachment of the frame member of Figure 5 to an existing structure according to the present invention.

Figure 7 is a pictorial view of the frame member of Figure 5 being attached to a stand member according to the present invention..

Figure 8 is a pictorial view of an attachment of the frame member of Figure 5 to an existing structure by a hanger member according to the present invention..

Figure 9 is a side elevation of an alternative attachment of the frame member of Figure 5 to an existing structure by a hanger member according to the present invention.

Figure 10 is a pictorial view of a backstop according to the present invention attached to the frame member of Figure 5.

Figure 11 is a side elevation of the backstop of Figure 10.

Figure 12A is a side elevation of a first alternative configuration of a backstop according to the present invention.

Figure 12B is a side elevation of a second alternative configuration of a backstop according to the present invention.

Detailed Description of a Preferred Embodiment

Referring to Figure 1, a net for sport practice 10 comprises a goal surface, preferably a net material 12, in which and through which are one or more goals in the form of goal apertures 14. The net 10 is substantially symmetric about a goal plane 16, so that a player or players may launch an object, such as a baseball, football, volleyball, tennis ball, ping-pong ball, badminton cock, frisbee or other object, toward the net and through a desired one of the goal apertures 14 from either side of the net. The goal apertures are sized and shaped according to the cross-sectional size and shape of the object which it is desired to launch. For example, while goal apertures for objects having circular cross-sections, such as baseballs and volleyballs, are advantageously circular, goal apertures may have other shapes for practicing sports involving an object having a cross-sectional shape that is not circular, e.g., for frisbees, as depicted in Figure 1. The selected size of the goal apertures may vary according to the sport and according to the player's present abilities. As an example of the former, a sport requiring that the object be delivered over a larger distance, or at a higher speed, may require (though it will not always require) a goal

aperture 14 that is relatively larger compared to the cross-section of the object than will a sport in which the player stands closer to the net or delivers the object less forcefully.

Material other than net material 12 may be employed for the goal surface; however, net material has particular advantages. For example, net material is generally stretchable, so that impact forces to the apparatus are minimized when a player misses the goal apertures. A lesser impact force allows lighter material to be employed, the lesser impact force and the lighter weight material allow a lighter structure (described below) for supporting the net. Another advantage of the net material 12 is that it presents relatively little wind resistance.

Referring to Figures 2-4, the goal apertures 14 are preferably removed, as by cutting or blanking, from a contiguous net material 12, under conditions in which the net material is not distended. Remaining edges 18 of the net material 12 are captured between a length of hem material 22, such as one or more fabric strips, which is or are folded over the edges 18 in the direction of the arrows 27 and adhered at adjacent complementary surfaces 24, capturing the edges 18 therebetween. The hem material 22 has periodically spaced slits 25 to permit forming the hem material around curved portions of the goal apertures 14. Adherence of the surfaces 24 can be accomplished by sewing them together, by employing an adhesive therebetween, or by other means known in the art.

The net material 12 also has edges 66 at side portions 29 thereof; however, preferably, the net material 12 is provided with a pre-existing hem material 68 capturing the edges 18 at the side portions 29. If the net material 12 is not provided with a pre-existing hem material 68, hem material 68 may be applied to the net material by folding over the edges 18 and capturing the edges 66 between adjacent complementary surfaces, as has been described for the hem material 22 and the goal apertures 14.

The location of the goal apertures 14 is selected so that a player has a selected, minimal chance of passing an object through one of the goal apertures 14 while aiming for another, and so that goal apertures 14 are disposed at a variety of locations on the goal surface to permit the player or players to practice delivery to varying locations within a

court plane. While a pattern of goal apertures 14 is shown as being regular, the invention also contemplates that the goal apertures need not form a regular pattern.

The goal surface is preferably attached to existing standards, preferably the net 12 being strung across existing upright poles 33 for use with existing nets employed in the sport of choice. Alternatively, the goal surface may be attached to a suitable frame 26, such as that shown in Figure 5. The frame 26 preferably includes frame members 28 connected at right angles to each other by connectors 30. Frame members 28 and connectors 30 may be steel or plastic plumbing pipe and elbow connectors, respectively, and may then include a coupler joint 34 for allowing all the frame members 28 and connectors 30 to be screwed together. Other, alternative embodiments of the frame 26 will be readily apparent to those of ordinary skill in the art.

The net material 12 is attached to the frame at, preferably, each frame member 28. The hem material 68 which secures the edges 66 of the net material 12 may then be clamped, tied, clasped, or bonded to the frame 26 in any of a number of ways that will be readily apparent to those of ordinary skill. An exemplary attachment is shown in Figure 5, employing eyelets 23 through which a string or rope 31 is threaded.

Referring to Figures 6-8, the frame 26 may be mounted to or hung from an existing structure 33, or may include a stand member 36 for holding the frame 26 in an upright position in the field. The stand member 36 may be folded sheet metal and may be bolted to the frame 26 with threaded fasteners 38, through holes 40 in both the channel member 37 and the frame member 26. For rigidity, at least two holes 40 in the stand member should be spaced-apart a distance "d1" which allows the stand member 36 to resist twisting of the frame member 26 as will be readily apparent to those of ordinary skill. Moreover, pad portions 39 of the stand member 36 should extend away from the frame a distance "d2" which permits the stand member 36 to resist toppling of the frame member 26 as will also be readily apparent. Other, alternative embodiments of the stand member 36 will also be readily apparent to those of ordinary mechanical skill.

Returning to Figure 6, when mounted to an existing structure 33, the frame 26 may have holes 42 which correspond to holes (not shown) in the existing structure, so that

threaded fasteners 44a, such as lag screws, may be inserted through the holes 42 into the holes in the existing structure, the existing structure allowing space 46 behind the goal apertures 14 for unobstructed passage of the object therethrough. An alternative means of attaching the frame 26 to an existing structure 33 is also shown in Figure 6. Clamps 41 may be employed to attach to the existing structure by threaded fasteners 44b, which preferably are the same type of fasteners as the fasteners 44a, through holes 47 in the clamps. The clamps 41 enclose a frame member 28 to capture the frame member between the clamp and the existing structure. If clamps 41 are employed, it is advantageous that the clamp contain a central hole 49, disposed over the frame member 28, and that the captured frame member 28 has a corresponding hole (not shown) for insertion of a threaded fastener, dowel pin or the like 51 to prevent rotation of the captured frame member 28. As will readily be appreciated, particularly advantageous attachments will depend on the nature of the existing structure. Moreover, the frame 26 may, itself, include other hardware for facilitating attachment to an existing structure, or may provide increased lengths of some of the frame members 28 for extending beyond the net material 12 to attach to or otherwise contact the existing structure.

Referring to Figure 8, when hung from an existing structure 33, hangers 48 may be employed, which are preferably constructed of sheet metal, the hangers being attached to the existing structure 33, preferably by the use of threaded fasteners 50 through hanger holes 52 in the hangers 48 and in the existing structure 33. Curved ends 54 of the hangers 48 may be looped under one of the frame members 28 of the frame 26.

Alternatively, hangers 48 may be attached to the frame 26, preferably by the use of threaded fasteners 50 through holes 52 in the hangers 48 and in the frame 26. Curved ends 54 of the hangers may then loop over the existing structure, as shown in Figure 9. Preferably, the hangers 48 are bent at a portion 53 thereof, so that the frame 26 may hang directly below the curved portion 54, so that it lies along an axis "L" that is substantially vertical.

Referring to Figures 10 and 11, in an alternative embodiment of the invention, a backstop 56 may be connected to and behind the frame 26 with respect to the player, for

returning an object passed through the goal apertures 14 to the player by rebounding the object. The backstop 56 preferably is a curved piece of sheet metal having a lip surface 58 on each side thereof, the lip surface having holes 60 therethrough for passage of threaded fasteners 62 into holes 64 in the frame 26. When constructed of sheet metal, the backstop preferably has a plurality of stiffening ribs 65 that have a dimension "d3" that is small compared to the object, so that they do not interfere with rebound of the object.

Referring particularly to Figure 11, the shape of the backstop is selected so that, an object 80, here preferably a ball, passing through a predetermined one of the goal apertures 14 will strike a first rebound inside surface 66 of the backstop 56 and be rebounded so that the angle "B" of travel that the ball makes with respect to an exit portion 68 of the first surface is substantially equal to the angle "A" of travel that the ball makes with respect to an entry portion 70 of the first surface. The ball is then made to follow a new path of travel and is caused to strike a second rebound inside surface 72 of the backstop 56 and be rebounded so that the angle "D" of travel that the ball makes with respect to an exit portion 74 of the second surface is substantially equal to the angle "C" of travel that the ball makes with respect to an entry portion 76 of the second surfaces. In the above manner, depending on the shape of the backstop 56, the ball may be caused to undergo a large number of small angle rebounds.

However, a preferred number of rebounds is two. A preferred method for achieving two rebounds provides a first rebound inside surface 66 oriented at substantially about 45 degrees declination, shown as line "L1", for directing a ball thrown inwardly along the horizontal downwardly toward the second rebound inside surface 72 substantially about 90 degrees, the second rebound surface 72 being oriented at substantially about 45 degrees inclination, shown as line "L2", for directing the ball received from the first surface 66 substantially about 90 degrees outwardly toward the player. Angles "A", "B", "C" and "D", therefore, will each be substantially about 45 degrees. It will be readily apparent to those of ordinary skill that a two-rebound backstop 56 may also be obtained from the configurations shown in Figures 12A and 12 B, the

choice being left to manufacturing ease and eye appeal. In particular, in Figure 12B, "R" can be any convenient dimension.

It is to be recognized that, while a specific net for sport practice has been shown as the preferred embodiment of the invention, other configurations could be utilized, in addition to configurations already mentioned, without departing from the principles of the invention. In particular, it will be readily appreciated, other components and other means of attaching the components may be employed for the frame 26, the stand member 36, the hangers 48 and the backstop 56, as is commonly known in the art.

The terms and expressions which have been employed in the foregoing specification are used therein as terms of description and not of limitation, and there is no intention of the use of such terms and expressions of excluding equivalents of the features shown and described or portions thereof, it being recognized that the scope of the invention is defined and limited only by the claims which follow.

I claim:

1. An apparatus for practicing a sport in which it is desired to condition a player's aim in throwing or launching a sporting object at a goal plane, the apparatus comprising:

a goal surface lying substantially in the goal plane; and

a plurality of goal apertures formed in and through said goal surface, said apertures being spaced-apart so that the player, in throwing or launching the object toward one of said goal apertures has a predetermined, minimal chance of passing the object through another of said goal apertures.

2. The apparatus of claim 1, wherein said goal apertures are sized and shaped according to the size and shape of the object.

3. The apparatus of claim 1, further comprising a frame member for supporting said net.

4. The apparatus of claim 3, further comprising a stand member for supporting said frame.

5. The apparatus of claim 4, wherein said stand member supports said frame in a substantially upright position.

6. The apparatus of claim 3, further comprising one or more hangers for hanging the frame on an existing structure.

7. The apparatus of claim 3 wherein said frame is mounted to an existing structure.

8. The apparatus of claim 3, further comprising a backstop for returning an object passed through one of said goal apertures to substantially the opposite direction from whence the object came.

9. The apparatus of claim 8, wherein said backstop is formed to permit at least two rebounds of the object at two inside surfaces thereof.

10. An apparatus for practicing a sport in which it is desired to condition a player's aim in throwing or launching a sporting object at a goal plane, the apparatus comprising:

a net forming said goal plane, said net having one or more spaced-apart goal apertures formed in said net for permitting passage of the object through said net.

11. The apparatus of claim 10, wherein said goal apertures are sized and shaped according to the size and shape of the object.

12. The apparatus of claim 10, wherein said goal apertures are spaced-apart so that a player aiming at one of said goal apertures has a predetermined, minimal chance of passing the object through another of said goal apertures.

13. The apparatus of claim 10, further comprising a frame member for supporting said net.

14. The apparatus of claim 10, further comprising a stand member for supporting said frame.

15. The apparatus of claim 14, wherein said stand member supports said frame in a substantially upright position.

16. The apparatus of claim 13, further comprising one or more hangers for hanging the frame on an existing structure.

17. The apparatus of claim 13 wherein said frame is mounted to an existing structure.

18. The apparatus of claim 13, further comprising a backstop for returning an object passed through one of said goal apertures to substantially the opposite direction from whence the object came.

19. The apparatus of claim 18, wherein said backstop includes a first inside surface having a substantially 45 degree declination and a second, spaced-apart inside surface having a substantially 45 degree inclination to permit two rebounds of the object, a first rebound being at said first inside surface and a second rebound being at said second inside surface.

ABSTRACT

A net for sport practice is provided having one or more apertures therein, the apertures being advantageously sized and shaped for passage of a ball or other object thrown or launched therethrough, in order to promote conditioning of the player's aim at a goal, and delivery into a court plane. A specially adapted frame may be employed for supporting the net; however, the net is preferably strung between existing standards, to minimize weight and maximize portability and ease of use. A backstop having inside rebound surfaces may be attached to the frame, for returning the object to the player.